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## Communications

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# The Treatment of Lithium-Induced Myxedema

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In many patients symptoms of depression mimic symptoms of hypothyroidism. Patients with either disorder can complain of weight loss or weight gain, constipation, drowsiness, and easy fatigability. It is not surprising, therefore, that the metabolic derangements in patients with manic-depressive illness who develop lithium-induced hypothyroidism are not always detected early. The diagnostic problem is illustrated in the following case presentation.

### Case Report

A 48-year-old Caucasian woman weighing 111 kg had been treated for manic-depressive illness for several years at a mental health center. She had begun taking lithium carbonate in 1975. When she first presented to her new family physician in August 1977, she was being maintained on lithium, 300 mg three times a day. At this time she was complaining of easy fatigability, dry skin, hair loss, and a weight gain of 45 kg during the past three years. She denied cold intolerance or constipation. She stated she thought her mother had a history of "hypothyroidism," but she was not certain.

Physical examination revealed an obese, intelligent, pleasant, oriented woman in no distress. Her affect seemed appropriate and mental status exam-

ination was within normal limits except for mild anxiety. Blood pressure was 130/84 mmHg and pulse was 84 beats per minute and regular. Scalp hair was somewhat thin. The skin was dry. Cardiopulmonary and abdominal examination results were within normal limits. Neurologic examination was normal except for somewhat sluggish deep tendon reflexes. The thyroid gland was nontender and not palpable.

Because of the patient's symptoms, a thyroid screen was performed. Initial laboratory values included a  $T_3$  uptake of 31.3 percent (normal 35-45 percent),  $T_4$  of 3.29  $\mu\text{g}/100$  ml (normal 4-11  $\mu\text{g}/100$  ml), and a thyroid stimulating hormone (TSH) assay of greater than 100  $\mu\text{U}/\text{ml}$  (normal 0-10  $\mu\text{U}/\text{ml}$ ). Additional laboratory results included a serum lithium level of 1.4 mg/100 ml, well within the therapeutic range. Hemoglobin was 12.5 gm/100 ml, hematocrit 38 percent, WBC 8,900/cu mm with a normal differential count; a urinalysis, electrocardiogram, SMA-6, and SMA-12 were all within normal limits, except for an elevated serum cholesterol of 309 mg/100 ml.

The diagnosis of hypothyroidism was made and psychiatric consultation was obtained regarding therapeutic plans.

Because of the severity of the patient's manic-depressive illness in the past, and her good response to lithium, it was determined that the patient should receive a trial of thyroid medication therapy while continuing her lithium dosage as previously.

The patient was given levothyroxine sodium (Synthroid) in a dosage of 0.05 mg/day, gradually

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increasing to 0.2 mg/day over a six-week period while thyroid function tests were monitored. After 12 weeks of replacement thyroid therapy, the patient demonstrated a 10 kg weight loss. Additionally, she was much less fatigued, and her mental status revealed no evidence of an exacerbation of her affective disorder. Thyroid function studies showed a  $T_4$  of 14.3 mg/100 ml,  $T_3$  uptake of 33.4 percent, and TSH of 3.5  $\mu$ U/ml. The lithium dosage had been reduced to 300 mg twice a day, while serum lithium levels were monitored.

At this writing, after six months of thyroid replacement therapy, the patient has lost 14.5 kg, is much less fatigued, reports less hair loss and dryness of skin, and, most importantly, has been able to continue to take lithium at a dosage sufficient to control her symptoms of manic-depressive illness and to maintain therapeutic lithium plasma levels.

### Comment

The development of hypothyroidism in patients taking lithium for manic-depressive illness was first widely reported about ten years ago.<sup>1</sup> Many attempts have been made to elucidate the mechanism of this interaction over the past several years. Shortly after this phenomenon was originally reported it was pointed out<sup>2-4</sup> that there is an increased incidence of thyroid disorders in patients with manic-depressive illness who were not taking lithium, so that a cause-effect relationship was difficult to establish. Several authors<sup>5-7</sup> postulated that lithium is more likely to cause the development of clinical hypothyroidism in patients with a subclinically deficient thyroid gland, and that patients with a family history of hypothyroidism (as in this patient), or of past abnormal thyroid function tests, may be predisposed to the development of lithium-induced myxedema. This implies that one should take a careful family history and perform thyroid function screening tests prior to prescribing lithium, though the drug is not contraindicated<sup>6</sup> in patients with a positive family history or abnormal thyroid function studies.

The exact mechanism of lithium interference with thyroid function is still being explored. Some studies<sup>8-10</sup> reported that lithium blocked the release of thyroxine from the gland, while a more recent report<sup>11</sup> has examined the possible relationship of immunologic factors such as the presence of thyroid antibodies in patients taking lithium.

Again in these studies, however, a cause-effect relationship has been difficult to establish.

Whatever the actual mechanism, 14.6 to 22 percent of manic-depressive patients treated with lithium may develop hypothyroidism,<sup>12,13</sup> and as many as one third of patients may have an initially increased TSH level,<sup>14</sup> which may or may not progress to frank hypothyroidism. The average duration of lithium therapy before the development of hypothyroidism has been shown to be two years and ten months with a range of five months to nine years.<sup>11</sup> It is generally agreed that under careful patient monitoring lithium-induced hypothyroidism should not constitute a serious side effect since the condition is readily reversible when lithium is discontinued or when thyroid hormone is administered concurrently with lithium medication. There have been no cases thus far reported in which permanent thyroid dysfunction or malignancy have evolved.

Most authors<sup>6,11</sup> recommend continuing lithium therapy while treating the patient's hypothyroidism with thyroid medication, noting that the clinical signs of decreased thyroid function usually disappear within three months (also demonstrated in this patient). In a report of 20 patients in the German literature,<sup>8</sup> lithium was even used as treatment for thyrotoxicosis, and in an American study,<sup>9</sup> lithium was combined with methimazole in the treatment of Graves disease.

In summary, hypothyroidism may occur in a significant percentage of manic-depressive patients treated with lithium. The mechanism for this interaction is not fully known, though predisposing factors, blocked secretion of thyroxine, and immunologic factors may be important. Patients who develop this abnormality may continue to receive lithium therapy while being treated for the hypothyroidism at the same time.

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## Elective Vasectomy: A Study of 843 Patients

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Vasectomy is currently the most widely used method of sterilization. It has proven itself to be an effective, uncomplicated method. In 1970, one out of seven men whose wives were between 30 and 44 years of age had undergone this procedure. The simplicity of the procedure lends itself to use in the office of the family physician. No other specialty is better suited to provide the medical, social, and family dynamics evaluation necessary prior to performance of this sterilization procedure. Vasectomy is a useful technique to be taught to family practice residents, and it is a valuable adjunct to the services offered to patients. This paper is based on a study of 843 vasectomies done by family physicians in an office setting over a five-year period.

### Methods

At a visit prior to the procedure, the patient was interviewed with his spouse, if married. At that time he was provided with information regarding the procedure. He and his spouse were given a full verbal description of the procedure. The medical

and social implications were discussed with particular emphasis placed on the remote possibility of effective surgical reversal. The possibility of spontaneous reanastomosis of either vas deferens was discussed. No strict criteria for rejection were established prior to the accumulation of the data of this particular study. Those patients with existent medical disease were evaluated for their medical problems in an appropriate manner. Psychosocial contraindications were few, but those problems were given special attention.

Patients with emotional or psychiatric illness were closely evaluated; if necessary, a psychiatrist was consulted. Patients with no children by either partner were discouraged unless the marriage was of five-years duration. Opposition by a patient's spouse was grounds for rejection unless legally separated or divorced. After this preoperative evaluation was completed satisfactorily, the patient was scheduled for surgery.

The surgical procedure was relatively simple. The scrotum was shaved, painted with antiseptic solution, and draped. The spermatic cord was palpated and the vas deferens isolated bilaterally. The physician held the vas deferens in a pinching fashion between thumb and forefinger. The overlying scrotum was infiltrated with 1 to 2 cc of 1 percent lidocaine without epinephrine. A deep injection of

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